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The Impact of Tax Policies on Economic Growth: Evidence from South-Asian Economies

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I. INTRODUCTION

There has been an unmitigated debate regarding the role of fiscal policy in regulating the levels and composition of revenue, expenditure and public debt with the objective of achieving fiscal tolerance over a period of time. In this context, in the literature numerous, basic policy issues are also highlighted: including appropriate size of the state, the role of the government in accelerating economic growth, social development and redistribution of the benefits of the economic growth, improving employment and social justice by reducing inequality in income and wealth between income classes and present and future generations, and ensuring efficiency by promoting optimum allocation of resources.

The public policy instruments, such as tax rate changes, have different implications in exogenous (neoclassical) and endogenous growth theories. The neoclassical theory predicts that permanent changes in government policies do not have permanent effect on the growth of output. This implies that changes in a country's tax structure should have only transitory impact on its long-run economic growth [Ramsey (1928); Solow (1956); Cass (1965) and Barro (1979)]. Such changes allow a country to move towards a higher or lower level of economic activity, but the new long-run growth path converges to the old long-run path. It is only the transition period from the old path to the new path that rate of growth of a country's real output can increase or decrease. The policy effects according to the endogenous growth theory are opposite to that of neo-classical theory which argues that changes in tax rate may have an impact on growth [Romer (1986, 1990); Lucas (1988); Rebelo (1991); Jones, Manuelli, and Rossi (1993); Aghion and Howitt (1992); Kim (1992) and Gomme (1993)].

The different views of neoclassical and endogenous growth theories fall out to the empirically testing the validation of exogenous versus endogenous impact of tax policies on economic growth. The changes in the tax rate will be permanent and, given their different effects on growth, under the both types of growth theories, it would be very useful to empirically distinguish the exogenous and endogenous policy effects on the growth.

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This study tests whether tax policies conducted by Pakistan, India and Sri Lanka have transitory or permanent effect on their economic growth. After this introductory section the organisation of the paper is as follows: Section II deals the theoretical and empirical background of the growth impact of public policies which shows that there is almost no study of this type for developing economies, Section III deals with a brief history of tax collection and economic growth of Pakistan, India and Sri Lanka showing low tax rates as compared to developing countries. Section IV highlights estimation methodology which shows how properties of time series and dynamic model are used to investigate the growth effect of an increase in the tax rate. Section V is devoted to the discussion of results shows that a rise in tax rate permanently reduces the level of output but has transitory effects on the economic growth. The last section gives conclusions emerged from the paper.

II. THEORETICAL AND EMPIRICAL BACKGROUND

As discussed above the major feature of the endogenous growth theory is permanent change in a variable (potentially influenced by government policies) causes a permanent change in economic growth of a country while the neo-classical growth theory predicts only temporarily effect of such policies. Therefore, the endogenous growth theory predicts that financing through taxes may have an impact on welfare and/or on growth. Tax policy can affect economic growth by discouraging new investment and entrepreneurial incentives or by distorting investment decisions since the tax code makes some forms of investment more profitable than others or by discouraging work effort and workers' acquisition of skills. The empirical literature suggests both direct and inverse relationship between tax burdens and rates of growth i.e., a higher tax burden can decrease or elevate the rate of economic growth. Thus, future economic output may be higher with the optimal rate of taxation and hence future tax revenues would be higher with a lower rate of taxation.[1]

Barro's (1979) tax-smoothing hypothesis says that, if the marginal cost of raising tax revenue is increasing the optimal tax rate is a martingale. This implies that changes in the tax rate will be permanent and, given their different effects on growth, under the two types of growth models, very useful in empirically distinguishing between the exogenous and endogenous models. The endogenous growth models predict that temporary government spending policies have a positive effect on output but a zero effect for permanent spending shocks. To analyse the effects of government spending decision Devereux and Love (1995) used a two-sector endogenous growth model which has been extended to allow for an endogenous consumption leisure decision. The findings explore that a permanent increase in the share of government spending in output financed with lump-sum taxes will endorse interest and long-run economic growth at the cost of social welfare. It also argues that a permanent increase in government spending reduces the long-run growth when it is funded with an income tax or wage income tax but a temporary rise in government spending increases the GDP but it has only transitory impact on the economic growth.

Karras (1999) analysed the effect of tax policies on economic growth for a panel of 11 OECD countries. The results support the theoretical predictions of the neoclassical growth theory and inconsistent with that of endogenous theory. Similar findings were

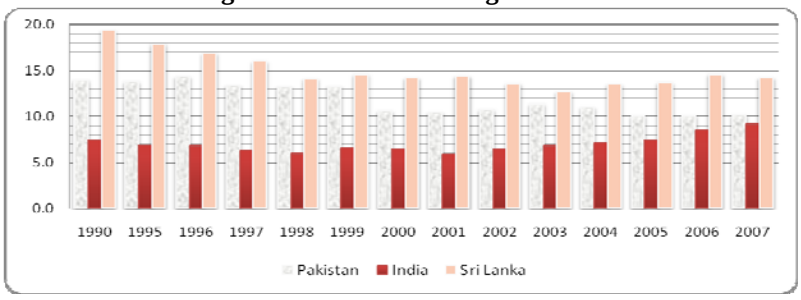
[1] See Scully (2006) and Kocherlakota and Yi (1996) for details.

found by Tomljanocich (2004) who tests empirically whether tax policies have transitory or permanent impact on the growth rate of output for the U. S. states. These all studies are about developed economies and almost no such study is available for developing economies. Therefore, present study aims to fill the existing gap in literature on fiscal policies and economic growth.

III. TAX COLLECTION AND ECONOMIC GROWTH SITUATION OF SELECTED COUNTRIES

To finance expenditure, government collects resources from various sources in such a way that it is equitable, improves social welfare and does not results in creating distortions in the economy. The trends in the Tax collection of the selected countries as summarised in Figure 1.

Fig. 1. Taxes as Percentage of GDP



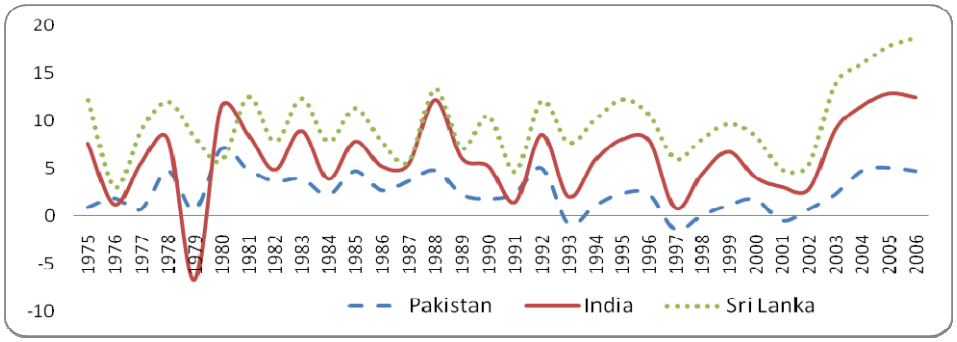
Sources: Key indicators of Asia and Pacific; Asian Development Bank (2008).

It reveals that, tax revenue collection has been the highest in Sri Lanka. In Sri Lanka, during 1970s, tax revenues were on average 18 percent of GDP, and this ratio persisted in 1980s. During the 1990s, the tax/GDP ratio started to decline and in 2007 it, for various reasons (presumably civil war and other exogenous disturbances) became only 14.2 percent of GDP. This is an unfortunate development and has largely been responsible for lower allocations to health and education. It is also surprising because IMF-led reforms generally require raising the tax/GDP ratio. Since 1970s, in India, the tax revenue/GDP ratio has remained in the narrow band of 6-10 percent of GDP, in 2007 the ratio was 9.2 percent. Pakistan is recognised as a country of having narrow tax base, grossly inadequate tax to GDP ratio and low elasticity of tax revenue with respect to GDP growth rate. Tax revenues are on average13.7 percent of GDP during 1980s this ratio has been reduced to 13.1 percent in 1990s, this declining trend persisted and in FY 2006-07 tax revenues reaches to only 10.6 percent of GDP. Consequently, even with good growth performance, low tax collection has forced the governments to rely on loans for financing of deficit. To increase tax revenue, during 2001 tax reforms are introduced and in this regard Federal Board of Revenue (FBR) has taken numerous steps. Introduction of large Tax-Payer Units (LTU), Medium Tax-Payer Units (MTU), Universal Self Assessment Scheme (USAS) and enlargement of tax base, are resulted in stimulating tax revenues. This increase is excellent in absolute terms but as a percentage of GDP these tax reforms are a failure.[2]

[2]Siddiqui (2006).

The low tax collection coupled with high expenditure is resulted in persistent fiscal deficit in the selected countries. This situation has deteriorated the economic performance of the countries. A brief history of economic growth is summarised in Figure 2. Since Independence from British Government, Indian economic growth rate remains very low and it has been referred as 'Hindu growth rate'. During 1990s, Indian has taken a decision to end up the closed and regulated policy regime and liberalised the economic policies and adopted an outward-oriented approach. Reforms in industry, trade, investment, financial sector and capital markets were introduced. This opened up almost all areas of the economy to domestic and foreign private investment. Similarly sound macroeconomic management resulted in reducing the internal and external imbalances helped in attaining sustained higher economic growth. Per capita GDP growth accelerated rapidly after 1990s from less than 4 percent in 1990s to around 7 percent after 2002.

Fig. 2. Per Capita GDP Growth Rate



Source: World Development Indicators (2009).

GDP growth in Pakistan has fluctuated significantly over the years. If in one decade country was categorised as fastest growing in the region, then in other decade it lost those gains. During 1970s, 1971 war has badly affected the economy. Consequently, economy went into recession in 1970s. Separation of East Pakistan, nationalisation of industrial, financial and other institutions accompanied with worldwide recession caused by oil crisis were some of the causes for the recession in Pakistan. During 1970s average per capita GDP growth was only 1.8 percent per annum. 1980s is a decade of revival of economic growth; per capita GDP grew at an average rate of 4 percent per annum. This growth rate has been achieved by promoting private sector, denationalisation and deregulation of industrial sector combined with stimulating the workers remittance flow and increased capital flows due to participating in Afghan war. During the last decade of twentieth century Pakistan faced severe fiscal imbalances. Because of Nuclear Test in 1998 different sanctions have imposed on Pakistan, debt burden reached to unsustainable levels. Moreover during entire decade there was political uncertainty in the country. For these reasons average annual growth fell to 1.4 percent in the Nineties. The growth rate touched its lowest of –0.4 percent in 2000-01. During that time more than half of the government's revenue was spent on debt servicing of public debt. After the event of 9/11, economic sanctions imposed following the Pakistan's 1998 nuclear tests have been lifted and debt is also rescheduled. Resultantly near stagnant economy suddenly started

showing miraculous growth. Per capita GDP grew at an average rate of approximately 5 percent per annum during 2004-06. However, at present due to electricity crisis, terrorism, rising prices of oil and commodities, increasing current account deficit, worsening law in order situation and worldwide recession Pakistan economy has lost its growth momentum.

Civil conflict in the north and east of the Sri Lanka has severely affected the Sri Lankan Economic growth. It can be seen that during 1970s per capita GDP growth was on average 5.6 percent and due to civil war in 1980's it fell down to only 1.6 percent country. However in spite of the impacts of civil war, economic growth has improved during 1990s and later on, per capita GDP growth is on average 4 percent during 1990s and in 2007 it was 4.9 percent.

It can be summarised that all the selected countries are poor and developing so to stimulate economic growth, curtail the incidence of poverty and improve the indicators of human development, these countries require tremendous amount of resources to finance development and social expenditures. Given the downward rigidity of current expenditure, and crucial importance of the development expenditure, the only way would be to mobilise additional resources by generating higher level of tax and non-tax revenues. Therefore, there is an urgent need for implementing tax reforms. To this end, these countries have to bring under-taxed and un-taxed sectors in the tax net. Above all, sincere efforts should be made for curbing smuggling, corruption and tax evasion.

IV. TESTING PROCEDURE OF ENDOGENOUS VERSUS EXOGENOUS GROWTH EFFECT

Evan (1997) proposes a methodology to examine whether fiscal policies have permanent or transitory impact on economic growth. Using a simple stochastic growth model that nests both endogenous and exogenous growth, he demonstrates that the growth rate should be stationary at level if any policy variable has exogenous effect on growth and difference stationary if it has endogenous effect, when any policy variable affecting investment is difference stationary. This study uses tax rate as a policy variable, which affects the investment, to check whether the effect of the tax policy is endogenous or exogenous on the growth in selected developing countries.

Unit root test is used to test the difference stationarity of the tax rate and then to verify whether the real per capita GDP growth rate series is stationary at level or difference stationary. When the tax rate series is difference stationary indicating tax-smoothing behaviour, for its endogenous effect on growth the per capita real GDP growth rate should be stationary at first difference and in the case of exogenous growth it should be stationary at level.

For robustness of the endogenous versus exogenous growth test the methodology of the Karras (1999) and Tomljanocich (2004) is used, as an alternative way by estimating a dynamic time-series model to check how permanent changes in tax rate affect economic growth. A natural procedure for testing the AK models is to test this restriction explicitly, considering the joint time-series behavior of taxes and growth. The restriction from the AK models suggests a dynamic relationship between taxes and growth as the following specification,

$$W_t = \eta + A(L)W_{t-1} + B(L)\tau_t + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

Where W is the growth rate of real GDP, η is intercept, $A(L)$ and $B(L)$ are P^{th}-order polynomials in the lag operator L and t index of time. This specification can be rewritten as,

$$W_t = \eta + A(L)W_{t-1} + B(L)\tau_t + \varepsilon_t + C(L)\Delta\tau_{t-1} + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

$$c_q = \sum_{j=q+1}^{p} b_j \quad \text{Where, } q = 1, 2, \ldots, p-1. \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

Where $B(1)$ is a parameter equal to the sum of the coefficients of polynomial $B(L)$, and $C(L)$ is a $(p-1)^{th}$-order polynomial whose coefficients are related to those of $B(L)$ according to (3). It follows that estimating $B(1)$ in model (2) can be used to analyse whether impact of tax policy is endogenous or exogenous on economic growth. If

(I) $B(1) < 0$ suggests that the sum of the coefficients in the polynomial $B(1)$ is negative and suggests that a permanent shock in the tax rates will permanently reduce growth as suggested by the endogenous growth theory.

(II) $B(1) < 0$ shows that the distortions in the tax rate has only transitory effect on growth, supporting neoclassical theory.

V. DISCUSSION OF RESULTS

Three South-Asian countries namely; Pakistan, India and Sri Lanka are included for the analysis. The selection of these countries is because of the same geographical location and common economic and political structure. The study could conduct panel analysis but in such a case there is a loss of individual properties of the countries. Moreover, Pakistan, India and Sri Lanka have different fiscal structure and definition of the variables. In such a situation panel data analysis may be spurious and it is very hard to draw specific policy conclusions on the basis of panel data results. To avoid such a situation the study conducts time series analysis for each country separately.

The data are obtained from International Financial Statistics (IFS) for the period of 1973–2008. The average marginal tax rate should be computed using changing weights. There are several reasons to choose total revenue-to-GDP ratio as a proxy of tax-to-GDP ratio. The computation of average marginal tax rate is difficult due to unavailability of data. The average tax rate, revenue-to-GDP ratio, would be a better proxy for effective tax rate than a fixed-weighted average marginal tax rate. Moreover, data of taxes for all selected countries are not available for reasonable long period for empirically valid results. Another reason to use revenue-to-GDP ratio is that governments are directly concerned to its total revenue, not the tax revenue alone, while deciding its expenditures. The per capita GDP is used as the proxy for economic growth.

Many tests are available to check for unit root in a time series but this study uses GLS transformed Dickey-Fuller (DF-GLS) which is the extension of Dickey and Fuller (1979) unit root test known as Augmented Dickey Fuller (ADF) test. Elliott, *et al.* (1996) propose a simple modification of the ADF tests in which the data are detrended so that explanatory variables are taken out of the data prior to running the test regression. The unit root test results are presented in Table 1 for each country. It shows that tax rate series for all countries are non-stationary at level but becomes stationary at first difference but the growth rate series is stationary at level.

Table 1

DF-GLS Unit Root Test Results

	Pakistan		India		Sri Lanka	
Unit Root Test in	Tax Rate	Growth Rate	Tax Rate	Growth Rate	Tax Rate	Growth Rate
Level	–2.483	–4.397*	–2.515	–7.369*	–.329	–.921*
First Difference	–.533*	–	–.394*	–	–.684*	–

*Indicates stationarity at 5 percent level. The selection of lag length is based on SIC. The inclusion of constant or both constant and trend as exogenous depends on DW and Adjusted R^2.

Thus tax rate series are difference stationary, consistent with the tax-smoothing theory, while the growth rate of per capita real output is stationary at level for all the three South-Asian countries. This shows that while using Evans (1997) methodology the results lead to the conclusion that changes in tax rate have exogenous impact on economic growth. Hence, first test indicates that the tax policies have only transitory impact on the growth in the selected South-Asian countries. These findings also support the neoclassical growth theory in the context of relationship between taxes and economic growth.

To make the analysis robust, as proposed in the previous section, the model 2 [proposed by Karras (1999) and Tomljanocich (2004)] has been estimated. Empirical estimates of model 2 are presented in Table 2. Overall analysis of all the three countries presents similar results. The value of constant term is positive and statistically insignificant for Pakistan and India but significant for Sri Lanka. *B*(1) is positive and statistically insignificant for Pakistan while for India and Sri Lanka it is negative and statistically

Table 2

Dependent Variable: Real GDP Growth Rate (W_t)

	Pakistan	India	Sri Lanka
C	0.007541	0.13279	0.052155*
	[0.169299]	[1.826196]	[2.154445]
τ_t	0.09674	–0.849258	–0.12658
[B(1)]	[0.306064]	[–1.516797]	[–1.069376]
W_{t-1}	0.048985	0.370216	0.205131
	[0.261704]	[1.836722]	[1.190013]
$\Delta\tau_{t-1}$	0.390968	1.457755*	0.21185
	[1.00204]	[2.442025]	[1.527523]
$\Delta\tau_{t-2}$	1.418877*	0.467287	
	[3.534296]	[0.707417]	–
R-squared	0.422423	0.546548	0.129461
Adjusted R^2	0.278028	0.306485	0.042407
AIC	–.21915	–.9553	–.28921
SIC	–.89534	–.47536	–.10964
DW stat	1.856722	1.945872	2.041616

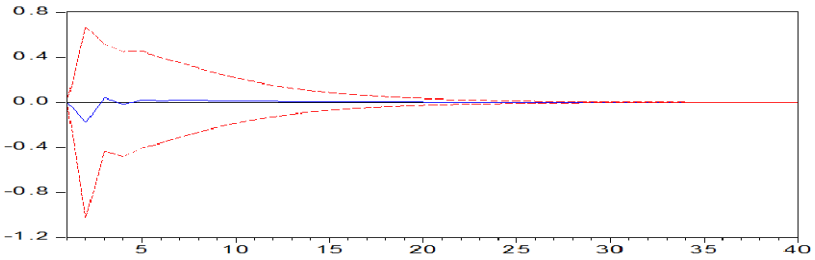
Note: The coefficient *t*-values are given in brackets. The lag selection in the model criteria are maximum Adjusted R-square and minimum of AIC and SIC. The lag lengths of differenced tax rate are four, seven and one for Pakistan, India and Sri Lanka, respectively.

*Indicates significance at 5 percent level.

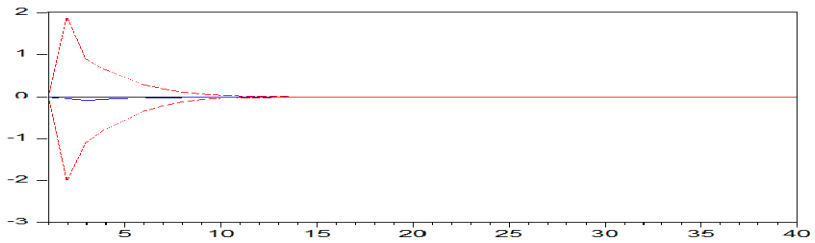
insignificant at 5 percent significance level indicating that it is not different from zero. The results designate that, the hypothesis that $B(1) = 0$ cannot be rejected in any of the country. Like our earlier analysis based on Evans (1997) methodology these findings also supports the view of neoclassical growth theory. Thus empirical analyses show that changes in tax rate do not permanently alter the real GDP growth rate. This means that the effects of tax rate changes on the growth are transitory. Our findings for the South Asian countries are similar to Karras (1999) who comes to the same conclusions for the developed countries.

The findings that tax policies have only transitory impact on the growth of these countries appeals for an analysis for how long this transitory effect of tax policy on economic growth persists in these countries. To analysis this issue, impulse response functions are estimated. Figures 3 shows the impact of one unit change in tax rate on real per capita growth rate of GDP of Pakistan, India and Sri Lanka.

Fig. 3. Response of Real per Capita GDP Growth Rate to One Unit Tax Rate Innovation Pakistan



India



Sri Lanka

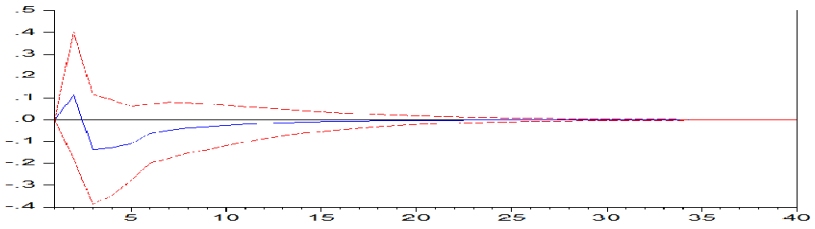


Figure 3 shows that for Pakistan 1 percent increase in tax rate decreases real per capita growth rate of GDP almost 0.15 percent for first year after that its impact decreases and lasts for almost 10 years and after that it expires. The Indian situation is illustrated in figure which shows that 1 percent increase in tax rate causes to decrease almost 0.1 percent decrease the growth rate and effect ends in 7 years. The situation of Sri Lanka is different from other two. The figure shows that for first years 1 percent increase in tax rate increases the growth rate almost 0.1 percent only for one year but after that it impacts negatively. This negative impact on the growth lasts almost next 15 years. The overall findings of the impulse response functions depicts that the impact tax policies on economic growth are transitory in Pakistan, India and Sri Lanka.

VI. CONCLUSION

This study conducts three different analysis first based on Evans (1997), second using Karras (1999) and Tomljanocich (2004) methodology and Impulse Response functions. Main focus of the study was to analyse the impacts of tax rate changes on economic growth. The analyses which are robust depict that tax policies adopted by the South-Asian countries have only transitory impact on their economic growth. However, Impulse Response function has shown government policies can affect the growth in the transition path to the steady-state growth. Second, a higher tax rate permanently reduces the level of output but has no permanent effects on the output growth rate. These findings suggest that the relationship between output and the tax rate is best described by the neoclassical growth theory and inconsistent with the endogenous growth theory.

In the light of above findings, the impact of tax rate changes is transitory and negative for short-term in Pakistan and India but for Sri Lanka its positive for first year and thereafter it has also negative effect on economic growth. The tax rates in all these countries are low as compared to developed countries. Due to low tax rates these countries heavily depend on bond financing and foreign debt. In view of these finding the most important policy implication of the study is that the optimal tax rate should be decided to finance the budget. For this purpose government can use debt and tax instruments simultaneously. For example, as Padda (2009) argues, in response to an unexpected increase in government expenditures or decreases in output the government should analyse how much part of this increase is becoming the permanent part of its expenditure. The permanent part should be financed by imposing taxes as after all its impact diminishes and the transitory part should be financed by issuing bonds. However, bond financing should be contingent providing a guard against transitory shocks to the budget and should be retired when good days come in future. In this way these South-Asian economies can minimises the tax distortion by spreading required tax increase over several periods.

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